USD-3A/4A

UNI-POLAR STEP DRIVER

USER'S MANUAL (V1.0)

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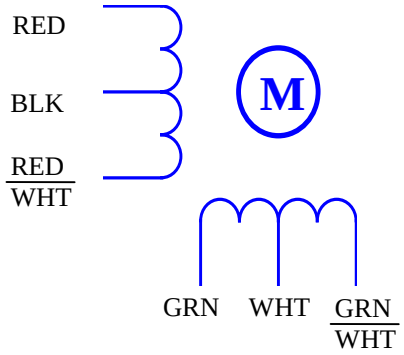
1 Types and applicable motors

1. USD-3A for 4 phase step motors ≦1.5A/phase
2. USD-4A for 4 phase step motors ≦2.0A/phase

2 Motor winding

(Please refer to your motor supplier's specifications)

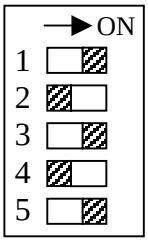


3 DIP switches

3.1 Mode control DIP switch

1. CW ：on for CW clock input (exclusive with CLOCK)
2. CLOCK ：on for CLOCK input (exclusive with CW)
3. CCW ：on for CCW clock input (exclusive with DIR)
4. DIR ：on for DIR clock input (exclusive with CCW)
5. HALF ：on for half step mode, off for full step mode

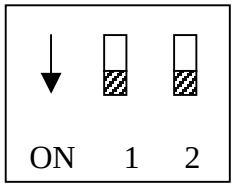
Example: Assume we want to set the driver to work at half step mode and the pulse input in CW CCW mode.

pin	setting	diagram
CW	ON	
CLOCK	OFF	
CCW	ON	
DIR	OFF	
HALF	ON	

3.2 Current control DIP switch

3.2.1 CURRENT OFF : driver in current off state, leave motor free. The heat LED (red) will light.
CURRENT ON : the driver in normal working state.

3.2.2 FULL CURRENT : while in normal working state the driver will provide the full current (the value depends on the active current setting) to the motor.
CURRENT DOWN (also called HALF POWER) : While the input pulse is stop more than 0.2 second, the driver will switch the current down to the setting value of STANDBY CURRENT to save the power and lower the temperature rise of the driver and motor. (Of course the torque of the motor also lower down)

diagram	function	
	Dip switch 1	Dip switch 2
	↓ current on	↓ current down
	↑ current off	↑ full current

***** For some cases, the duty cycle of the step motor is high or the application need high standby torque, the motor or driver maybe run to overheat, cooling fans are required to improve the temperature rise of the motor and driver.**

4 Current adjust

4.1 ACTIVE CURrent adjust: to adjust the current while the motor is running. Rotate the VR in CW direction to increase the current.

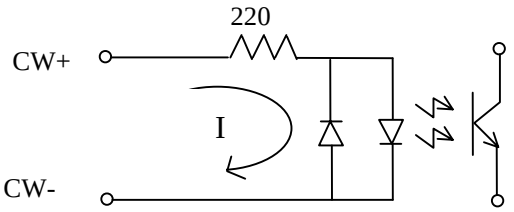
4.2 STANDBY CURrent adjust: to adjust the current while the motor is standby. Rotate the VR in CW direction to increase the current.

5 LED indicator

5.1 POWER led (Green) : light green LED while power on.

5.2 over HEAT led (Red) : light red LED while the driver case over 70 degree C and the motor will be in release state (no current in windings).

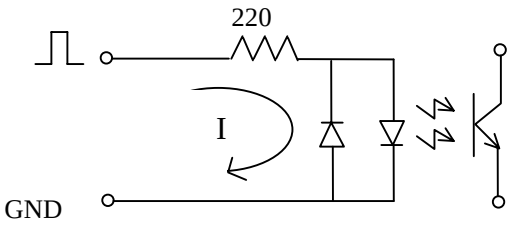
6 INPUT DIAGRAM



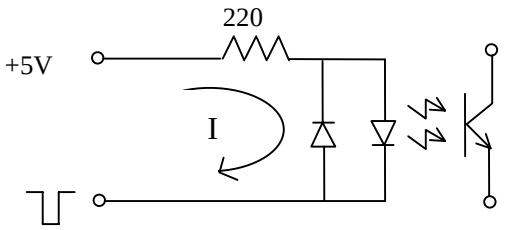
*** It is recommended to work at current I about 20ma for optimal performance. If your driving source is 5V system no other component is required between CW+ and CW-. Voltage higher than 5V is recommend to add a resistor to maintain I current at 20ma.

External resistor (ohm) = ((External voltage – 1.5V)/20ma) – 200 ohm

Active high connection



Active low connection



7 CONNECTOR ASSIGNMENT

Name	Descriptions
CW+ (CLOCK+)	CW+ or CLOCK+ input (depends on DIP switch setting ref 3.1)
CW- (CLOCK-)	CW- or CLOCK- input (depends on DIP switch setting ref 3.1)
CCW+ (DIR+)	CCW+ or DIR+ input (depends on DIP switch setting ref 3.1)
CCW- (DIR-)	CCW+ or DIR- input (depends on DIP switch setting ref 3.1)
COM	common node of step motor
A	A phase of step motor
B	B phase of step motor
/A	/A phase of step motor
/B	/B phase of step motor
AC 110V	AC power source
AC 110V	AC power source
FG	frame ground

8 CURRENT ADJUSTMENT PROCEDURES

Warning: The wrong procedures of adjustment may cause a permanent failure of the drivers or motors

Please follow the procedure step by step:

1. Power off.
2. Set current control DIP switch PIN1 to CURrent ON，PIN2 to FULL POWER..
3. Disconnect CW+ , CW-, CCW+ , CCW- wirings.
4. Connect a bi-polar current meter between COM terminal and the motor COM (NOTE: COMA and COMB are wired together as motor COM)
5. Power on, the driver will reset to 2 phase on state.
6. Adjust ACTIVE CURrent VR to get the current you need.

   ***** Note: The current reading is the double of current per phase, say if you need 1A per phase you should adjust 2A reading. *****

7. Set current control DIP switch PIN2 to CURrent DOWN. This procedure and the follows intende to adjust the current at motor rest state (holding torque) to prevent overheat.
8. Adjust STANDBY CURrent VR to get the current you need.
9. Power off.
10. Reconnect all the wirings, now it is ready to serve you.

9 Q and A

1. Q: How to extinguish 4 phase and 2 phase step motor

   A: 2 phase step motor has only 2 phase windings but the winding is similar to 4 phase step motor. Just not use the central tap of 4 phase step motor (take care not to short circuit the unused wire), you can get it work as 2 phase step motor.

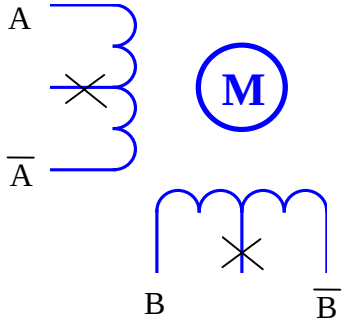


fig 1

4 phase step motor has 4 windings (maybe separated or central tapped)

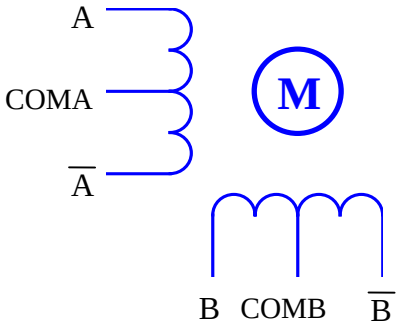


fig 2

2. Q: What is uni-polar driver and what is bi-polar driver?

   A: Uni-polar and bi-polar is defined by the current flowof step motor drived by the driver.

   If a driver drives its current to flow in only one direction (say, in fig 2, from COMA to A or /A only)the driver is defined as uni-polar driver. It can only be used with 4 phase step motors.

   If a driver drives its current to flow in only 2 direction (say, in fig 1, from A to /A and from /A to A) the driver is defined as bi-polar driver. It can only be used with 2 phase step motors.

3. Q: How can I choose the driver to match my motor?

   A: It is recommend to refer our catalog or website for the matching of motor and driver. (the column of compatible driver at the page of step motor)

   website http://www.automation.com.tw